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ABSTRACT

Problem solving skills such as patterning facts, locating problems, separating problems and solutions, and presenting effective written products are essential to success in the business community. Facts can be patterned using a grid relating a problem's effect at the individual, group, situational, and organizational level. Such a grid tests each solution's ability to solve a problem, for if a solution is inapplicable to the grid or fails sufficiently to account for the key elements in the grid, it must drop out of the problem solving process. To develop an effective problem statement, the patterns of relationships developed from facts must suggest the cause of the problem, the nature of the problem, and the effect or function of the problem. In addition, the problem should be factored more systematically to describe the immediate, the contingent, and the central problem as well as alternate or contributing problems. To separate the problem from the solution, specific criteria for each objective, the problem facts it would be accounting for, and other problem facts that might be affected can be placed on another grid. The presentation of the facts, or the business analysis, should sequence strategy positioning material to develop progressively as a persuasive statement. In each instance, the issue should be related to the needs dictated by the problem to be solved and the use to which the report must be put. (HOD)

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PROBLEM-SOLVING ANALYSIS AND BUSINESS WRITING

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PROBLEM-SOLVING ANALYSIS AND BUSINESS WRITING

It has become increasingly apparent that business analysis and analysis writing pose problems that are not always effectively addressed in the business setting. Among the most critical are those that occur as a result of the inability to pattern facts, to locate problems, to separate problems from goals and solutions, and to present an effective written end product.

Clearly, if we follow the testimony of management consultants and business analysts, the need to refine the practice of business analysis is surely there.[1] As Raymond Corey, management analyst at the Harvard Business School has said, "An ability to think incisively, to use evidence judiciously, to recognize hidden assumptions, and to follow to the end the often tortuous implications of a line of reasoning is an essential skill of management."[2] More than the need, however, the benefits of addressing such issues are clear enough. As Dan Schendel of Purdue University, a long-time observer of American business behavior, concludes, "It comes as a surprise to most students of management that the top executives in any organization are at the top and are highly paid precisely because they display unique abilities in defining problems and in creatively defining solutions or

courses of action that respond to these problems where others are unable to structure them."[3]

Patterning Facts

The first of four problems this paper will take up, ineffective patterning of facts, is the earliest and probably, as a result, the most devastating error in business analysis, for if problem-solving is skewered this early in the process all the steps that follow will be negatively conditioned. One difficulty, for example, is that once a pattern of relationships is established by the largest body of facts, other facts will start to fall out of the picture as peripheral, irrelevant, or of minor importance. A number of facts in these groups might, however, prove to be negative evidence that should ultimately be accounted for both as a test of any solution chosen and as a challenge to the accuracy of the problem-solving process itself.

Patterning of facts is begun once we have collected a sufficient spread of facts (quantity) which are sufficiently highly-valued (quality) to insure not only that our problem-solving is based on a representative sample but that the group of facts collected is reasonably exhaustive,

comprehensive, and systematic. Once the facts, both in the gathering and initial ordering processes, are determined to be sufficient to the purpose at hand, patterns of relationships can be solidified. Much like viewing an oriental carpet and selecting out figures in that carpet, defining patterns of meaning drawn from an initially meaningless ground of apparently unrelated materials can be a process requiring both patience and sensitivity to the materials being treated.

Patterned facts that outline relationships will allow us to start drawing conclusions, but we should not be tempted to do so initially. It is more useful to delay conclusion-drawing and to select out key pattern facts and discover the level at which they operate. Thus, we would be looking for the function of key pattern facts at the individual, group, situational, and organizational levels, asking ourselves what aspects of the problem they affect at each level. In this way, by the time solutions are devised and tested, the problem-solver has already developed a grid of key facts related by level to key problem aspects.

One such grid, used to study a case in employee relations, appeared in the following form:

GRID A

UNIT OF ANALYSIS	ATTITUDE, MORALE	PRODUCTIVITY	ACCEPTANCE OF AUTHORITY	GROUP COHESIVENESS	PROFIT	SALES	PUBLIC RELATIONS
INDIVIDUALS A. Jones-Apprentice							
B. Smith-Foreman							
C. Brown-Boss							
GROUPS A. Apprentices							
B. Machinists							
C. Union							
D. Management							

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The individuals and groups involved in the dispute under study (listed in the horizontal column) were related here to the relevant organizational and situational aspects that were most central to the issues in question (listed across the top of the grid). Once the relevant facts were entered, they could be read both laterally and longitudinally, providing immediate individual and group profiles as well as patterned fact complexes that described the organizational factors at the top. Once entered, the facts could themselves be read as if plotted on a graph, that is, they might be spread across the grid, indicating a problem endemic to the organization, or they might bunch in groupings that indicate problems isolated to one or more organizational aspects, one individual, or one work group. Moreover, if the organizational aspects of the problem were ordered so that they ran progressively from the most to the least important (given the nature of the particular problem, and as they do in our example), the most critical problem facts would to a large extent isolate themselves out in either the first vertical column or set of columns.

This grid can thus serve as a test for each solution's ability to solve the problem at hand, for if a solution is inapplicable to the grid or fails sufficiently to account for the key elements in the grid, it must drop out of the

problem-solving process. Moreover, by virtue of having been built up through a process of selecting, testing, ordering, patterning, and relating problem facts, the grid itself stands in an intimate relation to the problem and thus keeps the problem-solver problem-oriented, again in a relevant, competent, and material way, as he draws meaning from the problem situation.

Problem Statement

The second issue to be taken up is how to go about developing an effective problem statement. In order to begin this process, the patterns of relationships that we have already developed from the facts should be interpreted to draw three conclusions: the cause or genesis of the problem, the nature or structure of the problem, and the effect or function of the problem. Both genesis and function are, of course, outside the problem itself, but since the former initiates the problem and the latter expresses its end result, together they represent a useful way of looking at phenomena not always amenable to analysis in and of themselves, that is, phenomena that are not amenable to study by structure alone. In the physical sciences, for example, turbulence can be studied only through its effects, just as some elements of atomic physics can

only be seen through the impressions they leave on light or sound waves. In one sense, the latter are being studied as surrogates for the former. In any case, location and study of cause, structure, and effect together enables the problem-solver not only to see his problem wholistically, but to approach it from three different angles, so that by triangulation the problem can be most effectively pinned down.

But this process in itself is not completely sufficient to the task at hand for we must factor the problem more systematically into its different aspects. Thus, we should locate and describe the following: the immediate, accessible or pressing problem; the contingent, future or implied problem; the central, underlying, essential or most critical problem; and alternate or contributing problems. Where one begins to attack a problem statement will, of course, differ based on the nature of the individual problem. In general, however, with impenetrable or inaccessible problems, it is often more plausible to address first the immediate problem, for it, at least, is apparent and therefore describable. But while this point of attack carries with it the benefits of increasing one's familiarity with the problem and generating a feeling of initial success in dealing with a problem, approaching the

problem statement from the immediate aspect of the problem must not be confused with having described the problem itself in any significant way. We have, rather, merely nibbled away at the periphery of the problem and must ultimately work our way into its core. The immediate problem, nevertheless, must often be understood first, as problem-solving frequently cannot go on until its most pressing aspect is addressed. Only then does the problem-solver find himself sufficiently unpressured to go into the core of the problem at any length. In line with this argument, the pressure of an impending strike might represent an immediate problem that must be handled before management can resolve those underlying difficulties that precipitated the strike.

The contingent problem aspect responds to other needs, for it represents the continuing on-going nature of a problem if the core is not successfully addressed. Thus, the contingent problem frequently does not need to be discussed in an analytical way, although it must be clearly labelled and understood as that which will continue to be present should one incorrectly identify and treat the underlying or core problem. The contingent problem serves as a litmus test for the presence of the core problem and will itself disappear once that core is addressed.

Using the example of a strike situation, a contingent problem could be the continuing potential of the union to gain strength and take over management prerogatives with each new breakdown in employee-management relations.

Contributing problems, too, while distracting in themselves, pose no more than an annoyance factor, for they serve as dirt effects muddying the problem waters. Once labelled, they can be put aside, clearing the way to attend to the central problem. Moreover, once the central problem is addressed, these, too, will either disappear or cease to be problematic. In this category we might place weak management supervision practices and aggressive employee behavior, both of which contribute to exacerbate a nascent strike situation.

The central, that is the underlying or core, problem is not, however, so easily located or disposed of, but can be taken up with a greater degree of clarity once peripheral, contingent, and contributing problem aspects have been identified and put in their place. In our strike example, for instance, low employee morale, created by a split between apprentices and machinists and inappropriate personnel practices by the line foreman, was only identified as the underlying problem after

peripheral problem aspects were cleared away.

Separating Problems, Solutions, and Goals

In any case, it is difficult to truly understand a problem until the problem-solver has dealt with the third issue we are to take up, that is, until he has clearly separated in his own mind his problem, or what is wrong, from his goal, what he wishes to achieve or what is right, and his solution, the means of moving from what is wrong to what is right.

It is precisely at this point that most problem-solving breaks down, possibly because this part of the process frequently appears in theory self-evident, while in practice it rarely is. Let us consider one rather simple adaptation of a common example,[4] the following problem statement: "How can we use time-study to reduce boredom in order to achieve high productivity?" This statement has given us nothing to study, for it does not state a problem. In fact, it has proposed an objective (high productivity) whose relevance is not apparent since we do not know the problem for whose solution it is to act as a goal. The statement has, as well, assumed a cause (boredom) for the unknown problem and has

implied a solution (time study).

If we divide the problem model into obstacle (problem), the norm or standard against which that obstacle must be measured (goal), and means of removing the obstacle and achieving the norm (solution), it becomes apparent that all succeeding functions take their meaning from the initial problem itself which, if left unstated, as in our example, leaves us no point of reference.

We should have started with what is wrong, or the problem symptom: in this case, inventory was a third less than usual. Without having done so, it is difficult to proceed to develop a diagnosis (problem analysis), prescription (solution), and prognosis (plan of action and recommendations based on a desired result or goal), a procedure that would have insured that we clinically understood, investigated, and interpreted the complaint in terms of its starting point or etiology, its structure or anatomy, and its dynamics or physiology. This particular problem could, for example, have been caused by theft, high demand, or low supply, only two of which would have been affected by employee morale, and none of which need necessarily be related to boredom, the ascription of which is itself an unwarranted assumption. The question to

be posed may or may not, as a result, be related to the need for increased productivity; it might simply be a question of poor employee relations or a healthy market. The implied solution (time-study) would thus in almost all instances have been an irrelevant and expensive choice.

As a means of more efficiently separating problems and goals, it would be useful here, as it was when we looked at fact-gathering, to organize our problem statement in a grid. Thus, the key problem elements isolated by study of individual, group, situational, and organizational aspects could be represented in the following manner:

GRID B

UNITS OF ANALYSIS	KEY PROBLEM ELEMENTS	POSSIBLE CAUSES	EFFECT ON OTHER PROBLEM ELEMENTS	PROBLEM LEVEL	GOALS	CRITERIA Must Achieve	CRITERIA If Fail
INDIVIDUALS A. Jones							
B. Smith							
C. Brown							
GROUPS A. Apprentices							
B. Machinists							
C. Union							
D. Management							
ORGANIZATIONAL FACTORS A. Morale							
B. Productivity							
C. Chain of Authority							
D. Group Dynamics							
E. Profit							
F. Sales							
G. Public Relations							

With this grid it becomes possible to locate specific criteria for each objective we might want to obtain, relating that objective at the same time to the level of the problem it would be addressing, the problem facts it would be accounting for, as well as other problem facts that might be affected. By citing the problem level, for example, we can order our objectives by priority. We will have developed, as well as a clear sense of what specific criteria we will accomplish, a sense of what effects we should expect to see eliminated and what causes we should expect to see disappear if we are successful.

Presentational Strategy

The last issue to be raised here is the writing of the business analysis. The conventional approach is to present the solution in the same format that is followed in the process of analysis, preceded by an abstract or summary of that analysis. Thus, the Abstract or Summary would include the problem stated, the analysis indicated, and the solution posed. The presentation would then go on to a Problem Statement which would include three parts: problem context, background to the problem, and the problem itself described. Problem Analysis would follow in which the pattern of key facts would be interpreted and conclusions

drawn. Alternate Solutions would then be posed, compared, and evaluated, first against problem facts and then against goals to be achieved. Finally, Recommendations would be presented, defended, and justified.

Readers and users of such analyses, however, find such writing unrelated to the needs that arise in actual business situations in which such analyses are presented. Reports of this type, they assert, should highlight key aspects of the analysis, but by representing the analytical process as a persuasive argument with a conclusive effect. Rather than accumulate ideas, a written analysis should perform a sequenced strategy positioning material to develop progressively as a persuasive statement. That statement should, of course, reach a decision demonstrably supported by the material discussed, but with its focus on a clear plan of action that demonstrates the clarity of the decision made, its pragmatic value, its benefits, and its ability both to account for the problem and to achieve necessary goals.

In organizing the report, practical considerations should be given priority as the writer drops the role of a subordinate presenting an informative document to his superior and adopts that of a consultant submitting a proposal to a company officer.

Assume, for example, that we have been faced with a highly technical problem with an immediate need for its solution. Here, the user of the report would find lengthy problem statement, solution posing, and problem or solution analysis of less interest than the recommendation and its implementation. In such an instance, the latter elements should lead the presentation.

Suppose, in another instance, that the analysis has been authorized in a firm with a sensitive management problem. Imagine further that any solution that might be recommended is likely to meet resistance by one of a number of factions in a split upper-management team. In such circumstances, the recommendation itself is in jeopardy until its benefits are persuasively presented, leading us to message organization that would place benefits or goals to be achieved first in our presentation.

Take a third instance in which the problem is a complex one dealing with personnel or management style, the cause of which is in contention and data for which is largely unavailable or widely open to interpretation. This situation dictates opening the presentation with a statement of problem background and problem facts, for only if the situation itself is brought

forward and a problem orientation developed can common ground be achieved to supply the basis for common acceptance of the solution.

Analysis presentation thus presents issues in addition to those posed by the process of analysis itself. These are largely psychological issues based on the most advantageous means of getting a report's results accepted. As a result, the writer should focus not on arguing his case by exhaustive presentation and analysis of details, but on making a recommendation easy to implement through highlighting specific actions to be taken, making a recommendation attractive by stressing the goals it achieves or the benefits it carries with it, and developing common ground to diffuse resistance and insure wider acceptance. In each instance, the issue is related to the needs dictated by the problem to be solved and the use to which the report must be put. Whether that problem is highly technical, sensitive, contentious, or pressing will make considerable difference in the presentational strategy developed for reporting one's analysis.

Summary

This paper has isolated four key concerns in the analysis and presentation of business problem-solving. Based on the testimony of management consultants and business analysts, it has chosen those areas of error that are most frequently responsible in practice for skewering problem-solving. Replaced by more effective techniques, such as those outlined here, we could reasonably expect to find problems that are better defined, analysis that is more incisive, and solutions that are more responsive to both the nature of the problems they must account for and the goals they must achieve.

NOTES

1 See Kenneth E. Schnelle, Case Analysis and Business Problem-Solving (New York: McGraw-Hill, 1967); Thomas Raymond, Problems in Business Administration (New York: McGraw-Hill, 1955).

2 E.R. Corey, "Case Method Teaching," HBS Case Service 9-581-058, p. 7.

3 D.E. Schendel, "Managerial Problem-Solving and the Case Method," HBS Case Service 9-375-822, p. 3.

4 See discussion on separating goals, problems, and solutions in Norman R.F.Maier, Problem-Solving Discussions and Conferences (New York: McGraw- Hill, 1963); Charles H. Kepner and Benjamin B. Tregoe, The Rational Manager: A Systematic Approach to Problem-Solving and Decision-Making (New York: McGraw-Hill, 1965).